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PARASUICIDES IN THE NAVY AND MARINE CORPS: HOSPITAL ADMISSIONS, 1989-1995

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Executive Summary

Background

This is the first population-based study to identify and analyze nonfatal suicide attempts (parasuicides) in the US Navy and Marine Corps. Study objectives were to (1) determine parasuicide prevalence rates; (2) develop sociodemographic profiles of attempters by gender, service, and recruit status subgroups; (3) develop diagnostic profiles of attempters by the same subgroups; and (4) characterize diagnostically relevant groups, including substance abusers, repeat attempters, and those with mental disorders.

Approach

All active-duty Navy and Marine Corps hospital admissions between 1989 and 1995 (N = 410,384 archival records) were examined, and 4696 records (1.1%) were identified as probable parasuicides. *International Classification of Diseases, 9th Revision* diagnostic codes and Bureau of Medicine and Surgery injury cause codes were used to define the case sample.

Results

Overall, prevalence of parasuicides remained unchanged from 1989 to 1995. Risk factors associated with parasuicide were age (young), sex (female), paygrade (E1-E2/recruit), education (less than 12 years), and branch of service (Navy), though Marine Corps women had the highest parasuicide rates. Approximately 64% of cases used self-poisoning in their suicide attempt; about 31% used cutting; less than 1% used firearms. Mental disorders (including substance abuse disorders) were diagnosed in 93% of parasuicide admissions; more than half received a diagnosis of personality disorder. Mental disorder primary diagnoses more than doubled between 1989 and 1995, while substance use disorders alone increased from 30% to 41%.

Conclusions

Focusing on mental health issues, particularly among recruits and young enlistees, might enhance suicide prevention efforts.

Background

- Completed suicides
 - » Second leading cause of death in U.S. Navy
 - » Second leading cause of death in U.S. Marine Corps
 - » Difficult to predict or prevent
- Suicide attempts
 - » Prior attempts are one of the strongest risk factors for completed suicides
 - » Important indicator of extreme emotional distress
 - » No national or military population-based data on attempted suicides

Suicide is the third leading cause of death for 17- to 24-year-olds in the United States, and national suicide rates are increasing. For many years, suicide has also been the second or third leading cause of death in the military (the ranking varies, depending on the service, the year, and the age group analyzed; accidents are the leading cause of military deaths). Between 1980 and 1992, Marines had the highest suicide rate of any military branch. However, age-adjusted overall suicide rates in both the Marine Corps and the Navy are below those for the nation at large.

Suicide is a complex and statistically rare event involving multiple risk factors. It is extremely difficult to predict, so prevention efforts generally adopt broad-brush strategies that target large groups at relatively higher risk, such as adolescents, alcoholics, or recently bereaved individuals. The perception still exists that most nonlethal suicidal gestures are deliberate attention-getters, not “real” attempts. Yet 30%-40% of completed suicides have made a previous attempt, and the risk of a parasuicide becoming a suicide death statistic is 100 times greater than average in the first year following the attempt.

Military forces are required to be physically and mentally ready to engage in difficult and sometimes critical operations at any time. Any indicator of severe emotional distress, whether a genuine attempt to take one's own life or “merely” a classical cry for help, must be taken seriously and treated. In addition, because prior attempts are one of the strongest and most obvious risk factors for eventual suicide, methodical study of attempters can yield valuable information for suicide prevention teams.

Although suicide death statistics are available for both civilian and military populations, comparable data on suicide attempts do not presently exist. There have been only a few large community survey studies, the largest being the National Institute of Mental Health Epidemiologic Catchment Area (ECA) Study in the early 1980s. These studies have collected regional data and estimated national rates (the ECA Study estimated a lifetime prevalence rate of suicide attempts in the general population to be 2.9%), but this project represents the first research effort to identify and analyze nonfatal suicide attempts in the Navy and Marine Corps populations.

Study Objectives

- Determine prevalence of possible suicide attempts in active-duty Navy and Marine Corps personnel
- Develop sociodemographic profile of suicide attempters
 - » Navy/Marines
 - » Men/Women
 - » Recruits/Other active duty (ACTDU)
- Develop diagnostic profile of attempters
- Characterize diagnostically relevant subgroups
 - » Mental disorders
 - » Substance abusers
 - » Repeat attempters

This research project had four main objectives. The first was to determine prevalence rates for suicide attempts in the Navy and Marine Corps. This in turn would allow us to examine trends in nonfatal suicidal behavior and to compare attempt rates with suicide death rates in the two services.

The second objective was to describe suicide attempters demographically and to compare Navy attempters with those in the Marine Corps, male attempters with their female counterparts, and recruits with other active duty members. The demographic variables included age at admission, sex, race, paygrade, branch of service, education, recruit status (recruit or other active duty), months of service, and marital status.

The third objective was to develop a diagnostic profile of attempters, again comparing Navy and Marine Corps, men and women, and recruits and other active duty. Hospitalization/administrative variables included admission source, number of diagnoses, length of stay, and case disposition. Diagnostic variables included cause of injury, place of injury, and *International Classification of Diseases, 9th Revision* (ICD-9) diagnosis, which was used to develop variables indicating substance abuse and psychological disorders. (The ICD-9 manual was published in 1977 and is still current; the 10th revision is due out in the coming year).

The final objective was to isolate and characterize diagnostically relevant subgroups, particularly substance abusers, those with mental disorders, and those who were hospitalized again for another suicide attempt. These groups were targeted because of their prominence in the suicide literature as high-risk groups.

Research Database

- All active-duty Navy and Marine Corps hospital admissions between 1989 and 1995
- N = 410,384 admission records from 277,677 patients
- Diagnostic classifications associated with each record:
 - » ICD-9 codes
 - » Trauma, Cause, and Place codes (trauma incidents)
 - » Admission date and source
 - » Discharge date and disposition
- Up to 8 diagnoses per admission

The Naval Health Research Center (NHRC) has developed and currently maintains an electronic database of all active-duty admissions to naval hospitals from 1965 forward. To keep the size of the research file manageable, we needed to limit the time frame examined. As initial work for this project in 1997-1998 indicated that data were complete and reliable only through 1995, we decided to extract all hospital admissions records with admission dates falling between January 1, 1989, and December 31, 1995 — a 7-year span. This resulted in close to half a million records associated with more than a quarter of a million patients (number of admissions per patient on the file ranged from 1 to 39).

Admissions records recorded (1) basic demographic data; (2) ICD-9 diagnostic codes; (3) a 4-digit Bureau of Medicine and Surgery (BUMED) code (per BUMEDINST 6300.3B) assigned to all accidents, poisonings, or violent injuries (APVs), and indicating the general class of trauma incurred (Trauma code), the causative agent (Cause code), and the place of occurrence (Place code); (4) admission and discharge dates; (5) source of admission (eg, emergency room, quarters, or transfer from another hospital); and (6) disposition at discharge from treatment (eg, returned to duty, medical hold, separation).

An important element affecting data analyses was the fact that up to 8 diagnoses could be assigned to a single admissions encounter. The first-listed diagnosis always indicates the primary diagnosis, but there is no particular ranking associated with other diagnoses on the record. Some analyses presented in this report used only the primary diagnosis, while others searched through all diagnoses for representations of particular types of disorders. In the following graphs and tables, the latter method was used unless primary diagnosis is specified.

Limitations of the Data

- Retrospective archival data
- No subjective data from patients
- ICD-9 "E" codes (accident/suicide) not used by naval hospitals
- Positive identification/confirmation of cases as suicide attempts not available
- Rates may have changed since 1995

Although this is an impressive database, several caveats are in order with respect to the subject being investigated with these data. First and most obvious, the data are retrospective and limited to a handful of measures transcribed into these electronic files. They do not record any subjective patient data or psychological test results, apart from diagnoses that might have resulted from such tests. Information concerning the patient's personal and family history, possible precipitating events, personal evaluation of self or circumstances, general mood or affect, or explanation concerning his or her self-inflicted injury — the kinds of variables that would be targeted in a prospective study of suicidal behavior — are all unavailable in this database.

Perhaps even more importantly, positive identification or confirmation of cases as suicide attempts is not available. The ICD-9 manual contains a category of codes (E950-E959) to indicate injuries resulting from suicide and attempted suicide, but these codes are not used by naval hospitals. The best available code for case selection is the Trauma code, with code 4 indicating deliberate, self-inflicted injury. But inspection of the data revealed a number of Trauma code 4 injuries, such as a broken toe or bruised shoulder, that did not appear to be suicidal. (We dealt with this problem by using additional criteria for case selection, as will be explained shortly.)

One last caveat, an important one: The rates reported here are through 1995 only; they might well have changed since that time. Based on the as-yet unexplained fluctuations in Navy and Marine Corps suicide death rates (which rose sharply in 1995, then dropped just as sharply in 1996, only to rise again in recent months), interpolation of recent trends in suicide attempts from the 1989-1995 data presented here is not recommended.

Case Definition

Parasuicide:

“An act deliberately undertaken which mimics the act of suicide but which does not result in a fatal outcome.”

Kreitman, N. Social and Clinical Aspects of Suicide and Attempted Suicide; 1973.

The terms attempter and parasuicide are used interchangeably in this presentation.

The nature of the database creates a dilemma. The stated objective of the study is to analyze attempted suicides, yet cases are not positively identifiable from the available data. How might we impute suicidal intent to a self-inflicted injury — by the lethality of the method or the seriousness of the injury? Because the topic of suicide is so sensitive, particularly in the military, we have chosen to employ the term “parasuicide” rather than “attempted suicide.” Parasuicide, which was first used by Kreitman (1973) as an alternative to attempted suicide, applies to any deliberate, nonfatal self-injury or self-poisoning, irrespective of its medical seriousness or psychological intent, that *mimics* the act of suicide. This shifts the emphasis away from the implication that death was intended but not achieved (a failed attempt at suicide) to a more operational definition based on the resemblance to a suicidal act. It is hoped that this semantic hair-splitting will serve as a reminder that we cannot be certain from the archival data that any given case was indeed an attempt at suicide.

Sample Selection Criteria

- Navy and Marine Corps active-duty members admitted for treatment between 1989 and 1995
- Trauma code 4 (deliberate self-inflicted injury)
- At least one APV diagnosis on admission record
- Malingerers dropped
- Unlikely Cause codes excluded
 - » Fighting; Static object; Falling object; Fall/jump same level; Twisting/turning; Lifting/pushing
- Final sample = 4696 admissions for 4578 patients

This, then, is how the case sample was defined and selected. The basic database contained all Navy and Marine Corps active duty members who were admitted to naval hospitals for treatment between 1989 and 1995. All records having a Trauma code of 4 (deliberate self-inflicted injury) were flagged as probable sample members. Then, to eliminate as much error variance as possible, the sample was further refined by the following steps. Those without at least one APV diagnostic code on their admission record were eliminated from the case group (such individuals were either incorrectly assigned a Trauma code, or they had been admitted for a follow-up visit for a prior injury; if the latter, their initial record remained in the case group.) Individuals coded as having no complaint or sickness (eg, feigning illness, accompanying a sick person, seeking health information) were excluded from the case sample. Finally, in keeping with Kreitman's condition that parasuicides have face validity, records containing dubious Cause codes were dropped. Examples of such causes (which represent the method of self-injury) are "Twisting/turning" (eg, resulting in an injury such as a sprained ankle or knee) and "Static object" (eg, with an injury such as a broken hand or bruised shoulder). These procedures reduced the initial Trauma code 4 group by about 6% and resulted in a more credible sample of 4696 admissions deemed to be probable parasuicides.

Parasuicides 1989-1995

- 1.1% of all active-duty hospital admissions
- 7.3% of all trauma admissions
- 16 parasuicides per 1000 individuals hospitalized

Parasuicides accounted for 1.1% of all active-duty hospital admissions between 1989 and 1995 — approximately 11 parasuicides for every 1000 admissions, or 16 parasuicidal individuals for every 1000 patients hospitalized.

Trauma admissions include combat casualties, assault victims, injuries incurred from legal authorities, on-duty accidents, off-duty accidents, and deliberate self-inflicted injuries. Almost 16% of all active-duty hospital admissions were for APV traumas; parasuicides accounted for 7.3% of all trauma admissions.

Demographic Characteristics of Parasuicides by Sex, Branch of Service, and Recruit Status

Variable (at admission)	Men (N=3718)	Women (N=860)	Navy (N=3490)	Marine Corps (N=1083)	Recruit (N=663)	Other ACTDU (N=3905)	Overall (N=4578)
Age, mean	22.1	21.7	22.2	21.6	19.6	22.5	22.0 (range=17-53)
Sex, %							
Male			79.6	86.4	71.9	82.8	81.2
Female			20.4	13.6	28.1	17.2	18.8
Race, %							
White	79.5	72.3	78.9	75.9	75.9	78.6	78.2
Black	16.5	22.3	17.7	17.5	19.0	17.4	17.6
Other	3.9	5.5	3.5	6.6	5.1	4.1	4.2
Paygrade							
mean	2.9	2.5	2.8	2.8	1.0	3.1	2.8 (< E3)
% officers	.9	.9	1.0	.6	0	1.0	.9
Marital status, %							
Married	31.0	23.3	29.6	29.3	9.9	33.0	29.5
Div/sep/wid	4.3	6.9	4.9	4.6	1.0	5.8	4.8
Never married	64.7	69.9	65.5	66.1	89.1	61.2	65.7
Branch of service, %							
Navy	74.7	82.8			91.4	73.6	76.2
Marine Corps	25.3	17.2			8.6	26.4	23.8
Recruit status, %							
Recruit	13.0	22.0	17.6	5.3			14.7
Other ACTDU	87.0	78.0	82.4	94.7			85.3
Months served, mean	30.9	22.8	29.5	29.0	1.5	34.3	29.4
Education							
mean	11.9	12.1	11.9	12.1	11.8	12.0	12.0
< 12, %	9.7	1.9	10.5	1.4	14.2	7.4	8.4

For many of the analyses in this report, the sample was broken out by gender (19% women), branch of service (24% Marines), and recruit status (15% recruits). Analyses of demographic factors, presented above, revealed significant subgroup differences on most of the measures. Men and women differed significantly on every variable ($p < .05$ for age; $p < .001$ for all others); recruits differed from other active duty on every measure except race ($p < .001$ for all differences); and Navy and Marine parasuicides differed on age, sex, race, education, and recruit status ($p < .001$).

The following differences are of particular note for this study: Female patients were more likely than males to be in the Navy. They were also more likely to be nonwhite, unmarried, recruit status, and better educated (less than 2% of female parasuicides were non-high school graduates, vs. nearly 10% of the males).

Marines had a much lower proportion of both women and recruits represented, and they were better educated than Navy patients (only 1.4% of Marine Corps parasuicides had less than 12 years of education, vice 10.5% of Navy attempters).

Nearly all recruits (91%) were Navy members. Among the recruits, 28% of all parasuicides were women, compared with 17% women among other active duty attempters. Yet despite their large representation of women, more than 14% of recruit attempters did not have a high school diploma — the largest percentage of nongraduates in any of the subgroups.

These factors should be borne in mind when interpreting group differences on diagnostic variables. They also will help guide future analyses, and further exploration of these differences is recommended.

**Demographics of Navy Enlisted Parasuicides (1989-1995)
vs. Total Navy Enlisted Force (1992)**

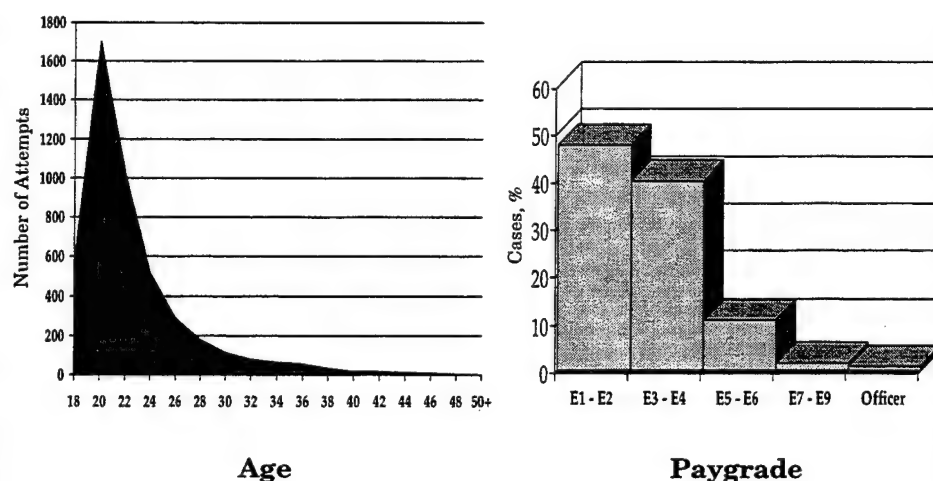
Variable	Navy Enlisted Attempters (N=3453)	Navywide Enlisted (N=481,780)	P
Age, mean	22.1	27.3	<.001*
Sex, %			
Male	79.7	89.7	<.001†
Female	20.3	10.3	
Race, %			
White	78.8	75.5	<.001†
Nonwhite	21.2	24.5	
Paygrade, mean	2.7	4.5	<.001*
Education, y			
mean	11.9	12.2	<.001*
< 12, %	10.6	5.3	<.001†

* t test
† Test for significance of difference between proportions.

At the present time, total force demographics for the study time period are available only for Navy personnel. Because only 34 of the Navy parasuicides were officers, this demographic comparison with the Navy at large was performed for enlisted members only. Navywide statistics are from 1992, which is the midpoint of the 7 years spanned by the study.

Comparative tests indicated that parasuicides differed significantly from the total naval force on every dimension measured. They were considerably younger and in lower paygrades; the proportion of whites was larger; there were double the percentage of women, and double the percentage of non-high school graduates in the parasuicide sample. These findings corroborate previous research, which has documented that being young, female, white, or poorly educated are risk factors for attempted suicide. (In contrast, completed suicides are more often males; and among white males, who have the highest suicide rates, rates tend to increase with age.)

Parasuicides by Age and Paygrade Navy and Marine Corps Personnel



The largest number of parasuicide admissions occurred among 19-year-olds (920 admissions, or about 20% of the case sample); 48% were age 20 or younger. By paygrade, the largest number of parasuicides was in the lowest rank, E1 (1338 admissions, or more than 28% of the sample). Admissions declined dramatically and consistently as age and paygrade increased. Age and paygrade are, of course, highly correlated.

Less than 1% of the sample were officers. Military members will sometimes try to protect their careers by avoiding exposure in military treatment facilities for stigmatizing conditions, such as alcoholism or psychological problems. This is especially true of officers, whose higher income level and closer association with the military infrastructure make it easier for them to select a private facility if they so desire. However, the urgent need for medical attention in a parasuicide situation might be expected to override such concerns in the minds of family or friends who bring the individual to the hospital for treatment. Therefore, it is more likely that the low representation of officers in this population reflects a confluence of risk-lowering factors (such as age, self-esteem, and low drug abuse) that are generally associated with higher rank.

Prevalence of Parasuicides, 1989-1995

Incidence of active duty personnel attempting suicide* U.S. Naval Services, 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Navy Men	79.7	98.9	101.0	73.4	73.6	76.8	81.3
Navy Women	199.9	215.3	218.9	121.4	142.4	168.4	173.7
Navy -Total	91.8	111.0	113.3	78.6	81.4	87.7	93.2
Marine Corps Men	68.4	105.2	77.3	72.2	72.7	66.7	67.3
Marine Corps Women	195.7	235.1	299.8	211.2	254.9	273.8	234.8
Marine Corps - Total	74.6	111.4	87.6	78.6	80.7	75.8	75.0
Men - Total	76.8	100.6	94.7	73.0	73.4	73.9	77.0
Women - Total	199.3	218.0	229.5	132.7	155.9	181.1	181.5
TOTAL	87.5	111.1	106.8	78.6	81.2	84.5	88.0

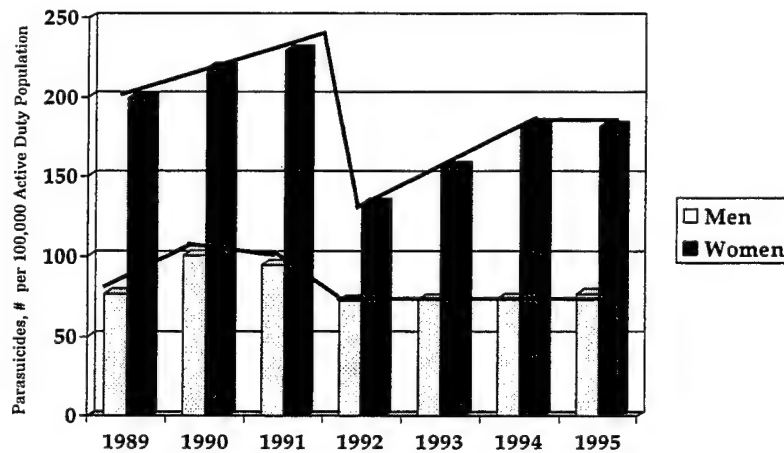
*Rates are per 100,000 active duty population for that gender/service group.

Prevalence rates represent the number of parasuicides per 100,000 population for the group indicated ($\text{attempts/total population} \times 100,000$). Population denominator data for each year were obtained from the *Department of Defense Selected Manpower Statistics, Fiscal Year 1996*.

Although there was considerable variation in the rates from year to year, the overall trend demonstrated a large increase in parasuicides during the 1990/1991 time period, followed by an even larger decrease, and an eventual return to "baseline" (1989) rates. Parasuicide rates peaked in 1990, when there were 111 attempters per 100,000 service members (repeat attempts by the same individual were not counted in these analyses). Parasuicides dropped to their lowest rate of less than 79 per 100,000 in 1992, then gradually increased to 88 in 1995 -- almost exactly the same rate (87.5) as in 1989. Thus, except for the spike in 1990/1991, the prevalence of parasuicides remained basically the same from 1989 to 1995.

Both the Navy and Marine Corps followed the same overall pattern, with parasuicide rates peaking in 1990/1991, then returning to initial (1989) levels by 1995. As would be expected, given the preponderance of males in the sample, the men's rates followed the same pattern. But although women's rates generally did, too, parasuicides among Marine Corps women (whose rates were the highest of any group) remained markedly above their 1989 levels throughout the ensuing years.

Parasuicide Prevalence Rates by Sex

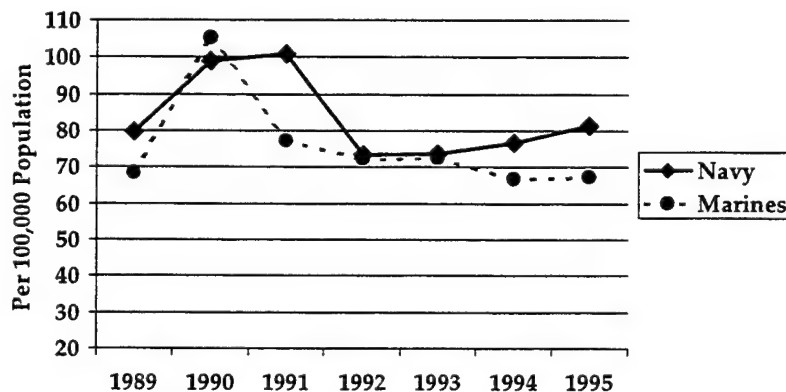


Parasuicide rates for women were 2-3 times higher than those for men. Studies have found that while nearly 80% of suicide completers are men, the majority of attempters are women. Previous research on the Navy and Marine Corps confirms that completed suicide rates in the military also are higher for men; the present findings corroborate that attempt rates are higher for female Sailors and Marines.

This graphic depiction of the yearly parasuicide rates between men and women illustrates how women's rates rose steadily, dropped sharply, then rose again before leveling off at a lower point than in 1989. Alterations in the men's rates were smaller, producing a much flatter curve, and men's rates were the same in 1995 as in 1989. Preliminary data for 1996 (not shown) indicate that the men's rates remained unchanged in 1996 at 77 per 100,000, while women's rates increased slightly to 188.

The highest overall rate for women was in 1991: 230 attempts per 100,000, compared with the men's rate of 95 per 100,000 that same year, and with men's highest rate of 101 the previous year. The lowest overall rates for both sexes occurred in 1992: 133 for women, 73 for men. As shown in the prevalence table on the previous page, the lowest rate for any of the female groups was 121 (Navy women, 1992), which was still almost 20% higher than the highest rate for any male group (105 for Marine Corps men, 1990).

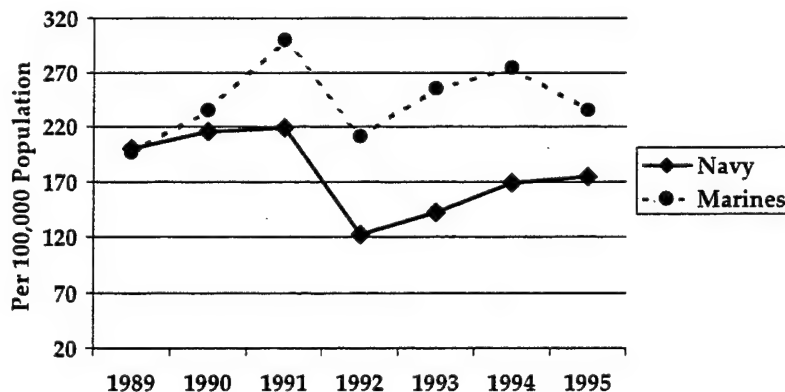
Prevalence of *Male* Parasuicides: Navy Vs. Marine Corps



This graph compares Navy and Marine Corps parasuicide rates for men only. Men in both services experienced a dramatic increase in parasuicides in 1990. Although speculation as to the cause of such a peak is exactly that — speculation — it is not unlikely that the escalation of military hostilities in Iraq, leading to Operation Desert Storm at the beginning of 1991, was a contributing stressor for these individuals. The war ended in March 1991, and Marine Corps rates dropped back down in 1991, while Navy rates remained high until 1992. Further investigation into the time of year that the parasuicide incidents occurred might help in interpreting these findings.

Apart from the spike observed in 1990/1991, overall rates in both services remained basically the same between 1989 and 1995. Preliminary data for 1996 (not shown) suggest that male parasuicides increased somewhat in the Navy (to 85 per 100,000) while dropping to a new low in the Marine Corps (60 per 100,000). Note that male Marines' attempt rates were lower than the Navy's every year except 1990.

Prevalence of *Female* Parasuicides: Navy Vs. Marine Corps



This figure compares parasuicide rates for Navy and Marine Corps women. Here, the services are reversed, and it is the Marines who have the higher rates — substantially so, peaking to a high of 300 per 100,000 in 1991 (vice Navy women's high of 219 that same year, and Marine Corps men's high of 105 in 1990). Again, Operation Desert Storm and its antecedents likely played a role in these parasuicides, with somewhat differential impact on the various sex/service subgroups.

Preliminary 1996 rates (not shown) indicate a further decline in parasuicides among female Marines (to 222 per 100,000) and a further rise in Navy rates (to 183). Thus, the trend is for the rates in both services to be approaching their respective 1989 levels, though female Marines remain above their initial level (196 in 1989), while female Sailors remain below theirs (200).

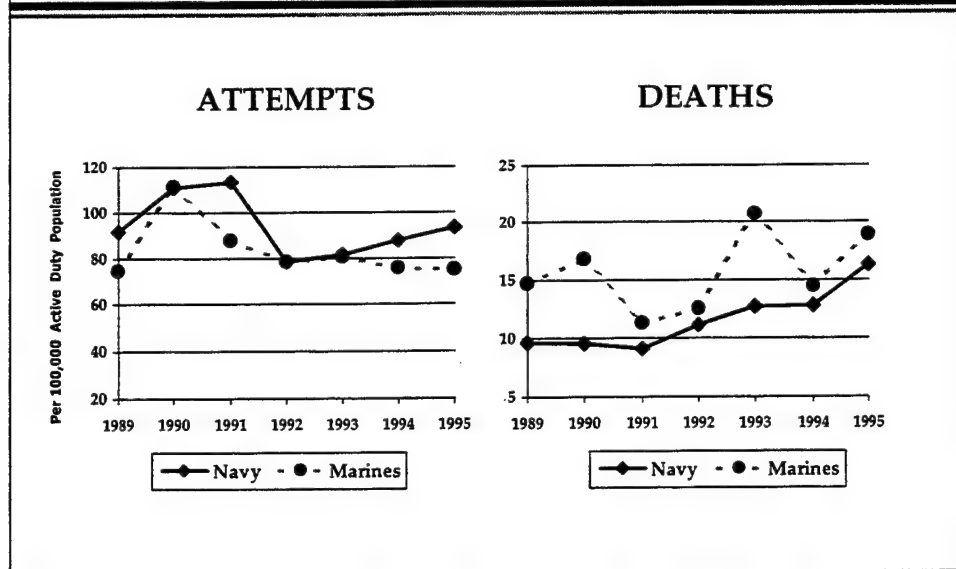
Ratio of Parasuicides to Suicides (1989-1995)

- **Navy = 9:1**
 - » Men = 6:1
 - » Women = 71:1
- **Marine Corps = 6:1**
 - » Men = 5:1
 - » Women = 30:1
- **Estimated national civilian ratio = 4:1 to 18:1**
 - » Men = 8:1
 - » Women = 59:1

Navy and Marine Corps ratios were computed using the self-inflicted death rates reported in the *Department of Defense Worldwide U.S. Active Duty Military Personnel Casualties, October 1979 through September 1998*. National rates, particularly for suicide attempts, are much less reliable and more difficult to obtain. The ECA Study, in which rates were weighted to be representative of the U.S. population, estimated the ratio of attempts to completions in the general population to be 18:1. Other, smaller studies have suggested overall ratios of 4:1 and 10:1. When stratified by gender, the estimated ECA ratios were 8:1 for men and 59:1 for women, which means that men have higher completion rates than women (the higher the ratio, the *lower* the completion/death rate, relative to attempts).

The ratios presented in this table depict much lower completion rates for women (vs. men) in both the military and civilian sectors. However, with the exception of Navy women (whose completion rates were the lowest of all groups), the ratios indicate higher overall completion rates in the military sector. Marines had the highest completion rates among both males and females. Bear in mind that the ratios were computed using crude (unadjusted) rates, so descriptive comparisons across populations should be interpreted cautiously. Also remember that neither part of the ratio indicates attempt rates or death rates per se, and no comparisons should be made between group numerators or denominators as such (eg, a population with 1000 attempts and 100 deaths would have the same ratio, though very different absolute rates, as the same population with only 10 attempts and 1 death).

Prevalence Rates for Parasuicides and Suicides Navy vs. Marine Corps



When overall parasuicide (attempt) and suicide (death) rates are plotted for the Navy and Marine Corps from 1989 to 1995, two things are immediately apparent. First, parasuicide rates were higher in the Navy, while suicide death rates were higher in the Marine Corps. Second, whereas parasuicide rates were about the same in 1995 as in 1989, completed suicides had increased in both services.

Preliminary 1996 data suggest that while parasuicides continued to increase in the Navy (to 98 per 100,000), there was a large decrease in naval suicide death rates (to less than 11 per 100,000). By contrast, in the Marine Corps, parasuicides declined to a new low (of 68 per 100,000), while suicide death rates remained about the same (18 per 100,000). More data are needed to fully develop these trend lines, as well as to investigate the kinds of attributes that distinguish attempters and completers.

Hospitalization Variables (Parasuicide Admissions)

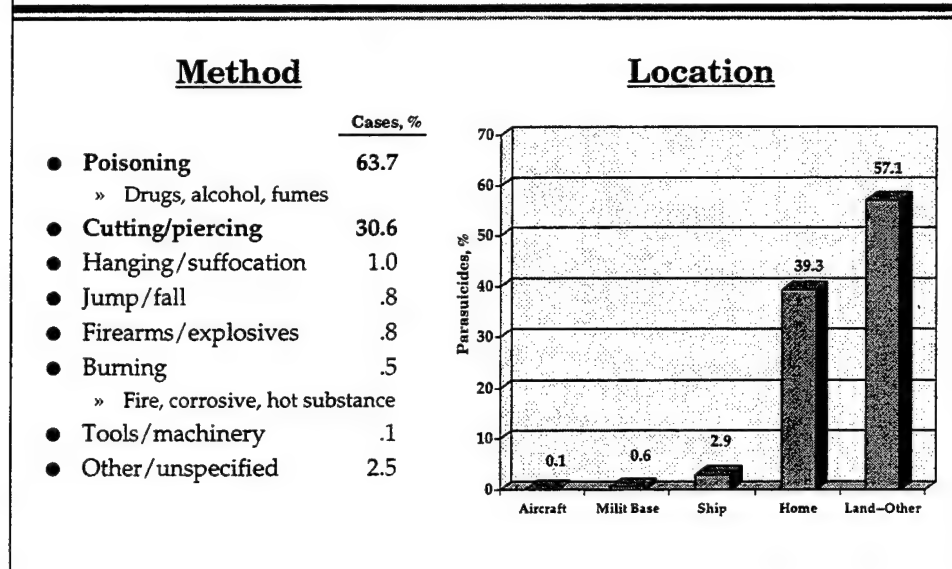
- 46% admitted via emergency room
- Average of 4 diagnoses at admission
- Average length of stay: 7 days
- Disposition
 - » 93% returned to duty following treatment
 - » None separated from service at treatment discharge

Approximately half (46%) of the parasuicide patients were admitted to the hospital directly from the emergency room. Admission source codes in the database do not indicate how the remaining patients were brought in, except for a handful of cases that were transferred from another hospital (usually a nonmilitary facility).

Patients were diagnosed with an average of 3 to 4 conditions (ICD-9 diagnostic codes) when they were admitted. Length of stay (LOS) ranged from same-day discharge (no overnight) to 209 days, with an average LOS of 1 week (7 days). This is a significant length of time, indicative of a genuine need for treatment. General hospital policy nationwide is to minimize bed days insofar as medically supportable, and the average LOS for all patients hospitalized in naval facilities for any reason between 1989 and 1995 was 5 days (range = 1 to 536 days). It is probable that drug and alcohol rehabilitation programs (typically 42 days in length) raised the mean LOS for parasuicide patients, but further analyses are needed to determine the extent of their contribution.

It would appear that almost all of these individuals (93%) were treated successfully and returned to their jobs at their commands. The remainder were either transferred to another medical facility (about 3%), placed in medical hold at the treating hospital (3.5%), discharged to another federal facility, such as a VA hospital (.4%), or reported AWOL (.1%). None was separated from naval service at the point of discharge from the hospital, though how many of these individuals were later discharged by their commands is a question for further research.

Method (Cause of Injury) and Location (Place) of Parasuicide Incident

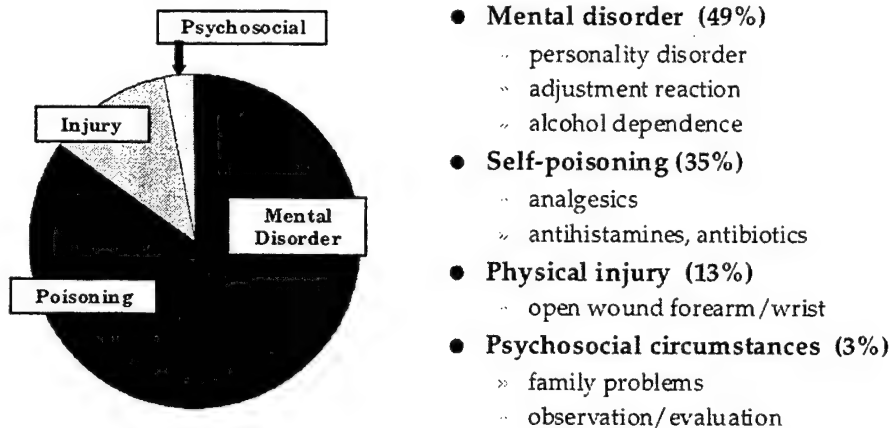


Cause codes provided information regarding the method used in the parasuicide incident. The two predominant methods — self-poisoning/drug overdose and cutting/piercing — are considered to be less lethal than hanging, jumping, and firearms. Selection of these methods does not necessarily mean that the individual did not intend to die, of course, but the small number of parasuicides who used firearms, when firearms would presumably be more readily available to a military population, is interesting to note. Previous research on completed suicides in the Navy and Marine Corps found that firearms were the primary method used, with 55% of Navy men, 41% of Navy women, and 74% of Marine Corps men using guns to kill themselves. Similar percentages have been reported for suicides in the general population. Poison/asphyxiation was the second most frequent method used in Navy suicides (32% of men, 52% of women), but virtually none of the completed suicides resulted from cutting/stabbing. In a recent study of 100 emergency room patients who made serious, but nonfatal, suicide attempts, 93% overdosed on drugs or drugs with alcohol, 4% used cutting/stabbing, and 3% used asphyxiation. All self-inflicted gunshot wounds received in the emergency room during that study were fatal.

Almost all parasuicide incidents occurred at the individual's home/quarters or other off-base location. Only 3% of the incidents took place aboard ship.

Primary Diagnosis at Admission

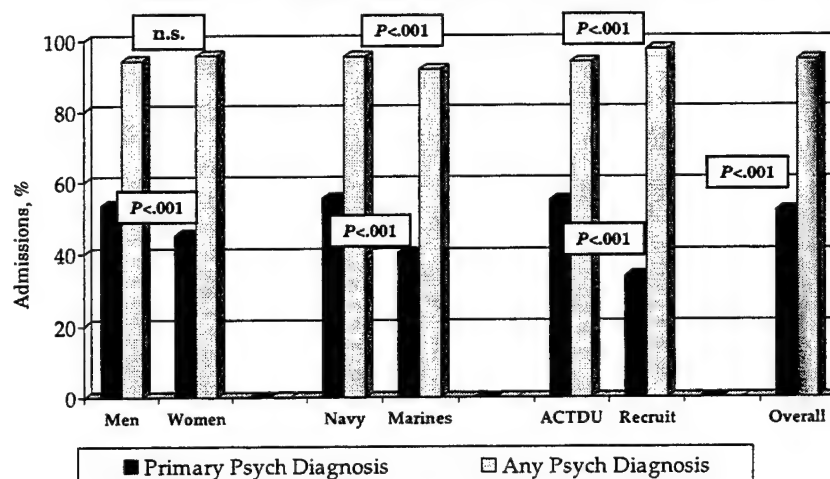
(N = 4696 Parasuicides)



Primary diagnosis was grouped into four categories, based on ICD-9 diagnostic codes (less than half a percent of patients had a primary diagnosis that was other than APV or psychological in nature; this tiny fraction is not represented in the pie chart.)

Mental disorders accounted for half (49%) of all primary diagnoses in these patients; self-poisoning (primarily drug overdose) accounted for more than a third (35%); self-inflicted wounds (primarily cutting the wrist/forearm) were 13%; and family problems or other psychosocial circumstances, along with admission for observation or evaluation, constituted just 3%. Thus, although nearly two thirds of the parasuicides had injured themselves by self-poisoning (see previous slide), only about half of those patients received a primary diagnosis of poisoning. And whereas nearly a third were admitted with self-inflicted lacerations or puncture wounds, less than half of them were diagnosed as primarily a physical injury case. The remainder received mental disorder diagnoses. ICD-9 mental disorders include drug abuse, drug dependence, alcohol abuse, and alcohol dependence. If these substance use diagnoses are eliminated from the analysis, the percentage of primary mental disorder diagnoses drops to 39%.

**Psychological Disorder As Primary Diagnosis
and As Any Diagnosis (Parasuicide Admissions)**

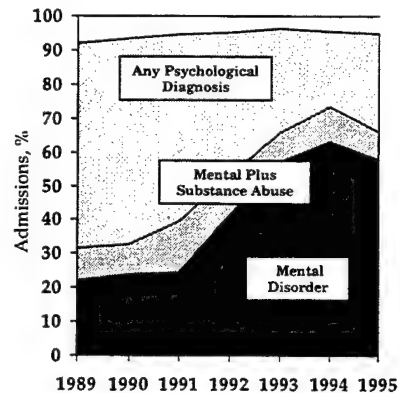


The general category “psychological disorder,” as used here, combines ICD-9-designated mental disorders (ICD-9 codes 290-319) — including substance abuse (ICD-9 codes 303-305) — and psychosocial problems, operationalized as several ICD-9 “V” codes. This graph breaks out psychological disorder by subgroups, plotting both primary psychological diagnosis and any psychological diagnosis (I.e., occurring anywhere on a patient’s admission record).

Men were more likely than women to have a psychological disorder as their primary diagnosis, but men and women were equally likely to have at least one psychological disorder noted on their admission record. A larger proportion of Navy parasuicides received psychological diagnoses than did Marines, and this was the case for both a primary diagnosis and any diagnosis of psychological problems. The group least likely to be diagnosed as primarily suffering from psychological dysfunction was the recruit subsample, 34% of whom received a primary diagnosis of psychological disorder. Yet recruits were more likely than all other active duty attempter to have “any” such diagnosis, with almost 98% receiving at least one psychological disorder diagnosis at admission.

Psychological Disorders Among Parasuicides, 1989-1995

- Primary diagnoses of **mental disorder**, (excluding substance abuse disorders) almost tripled in 6 years, from 22% in 1989 to 63% in 1994.
- **Substance abuse** disorders accounted for approximately 10% of additional primary mental disorder diagnoses annually.
- Almost all admissions every year had at least one psychological diagnosis (primary or other), including substance abuse and psychosocial problems.



Primary diagnoses of “pure” mental disorders (excluding the 3 substance abuse diagnoses) increased from 22% in 1989 to 63% in 1994, then dropped somewhat to 58% in 1995. Almost all of the increase occurred during the 3 years between 1991 and 1994. This sudden jump in mental disorders echoes the 1990/1991 spike in parasuicide prevalence rates. But whereas parasuicide rates subsequently declined to initial 1989 levels, the percentage of parasuicide admissions diagnosed as primarily mentally ill remained high.

Interestingly, while both parasuicide rates and mental disorder diagnoses exhibited large increases during the study, primary diagnoses of substance abuse or dependence remained fairly constant over the 7-year period, fluctuating between 8% and 15%. Overall, substance abuse accounted for approximately 11% of additional mental disorder primary diagnoses.

The global measure “any psychological diagnosis”(i.e., mental, substance, or psychosocial, occurring anywhere on the record) ranged from 92% to 97% over the years, revealing that virtually every attempter was diagnosed as having some sort of psychological problem. Whether the troubled psychological status was a preexisting condition or a tautological evaluation of the parasuicidal event cannot be determined from this analysis, however, and care should be taken not to confound predictor and criterion.

Top 5 ICD-9 Mental Disorders Among Parasuicide Admissions

ICD-9 Diagnosis	% All * Mental Disorder Diagnoses	% Primary Mental Disorder Diagnoses
Personality disorder	36.3	30.3
Adjustment reaction	23.2	34.4
Alcohol dependence	12.7	14.2
Nondependent drug abuse	11.8	6.4
Neurotic disorder	8.6	5.7

* Occurring across all diagnoses on an admission record, not just the primary diagnosis.

These are the 5 leading ICD-9 mental disorders appearing in the parasuicide admission records. The ICD-9 classification manual delineates 10 main categories of psychotic disorders, 17 categories of neurotic disorders, and 3 mental retardation diagnoses. Yet the 5 categories in the table (above) accounted for 93% of all mental disorders documented in the sample.

Percentages were computed on the 4,325 records containing at least one ICD-9 mental disorder diagnosis (ICD-9 codes 290 - 319). Percentage of *all* mental disorder diagnoses (first column) was computed by summing across all mental diagnoses on the admission records (a patient can have up to 8 diagnoses per admission), identifying the 5 diagnoses with the highest tallies, then dividing the tally for each by the total number of mental disorder diagnoses occurring in the sample (a total of almost 8000 diagnoses). Percentage of *primary* mental disorder diagnoses (second column) was based on the frequencies for primary diagnoses only. Both computations produced the same "top 5" list. Note that the percentages reported here reflect the total number of mental disorder diagnoses occurring on the admission records, not the number of individuals receiving the diagnosis.

Rates and ranking are similar for the two approaches. However, Personality Disorder, which is the highest-ranking disorder when all diagnoses are considered, falls to second place behind Adjustment Reaction when only primary diagnoses are counted. Also, Nondependent Drug Abuse (which includes alcohol abuse) is almost twice as likely to appear when all diagnoses are taken into consideration, rather than just the primary diagnosis.

It is surprising that depression is not represented on this list, as the literature documents a strong link between depression and suicidal behaviors. However, these results are based on the *main* ICD-9 diagnostic categories and do not reflect the numerous and complex diagnostic subcategories that occur under various main headings. The specific issue of depressive disorders will be addressed shortly.

Top 5 ICD-9 Mental Disorders, by Sex and Service

Rank-Order of Diagnosis, and Percentage of Individuals Diagnosed With Disorder*

	Overall Rank (%)	Men Rank (%)	Women Rank (%)	Navy Rank (%)	Marines Rank (%)
Personality disorder	1 (52.6)	1 (52.2)	1 (54.7)	1 (55.6)	1 (43.0)
Adjustment reaction	2 (39.1)	2 (37.6)	2 (45.8)	2 (39.9)	2 (36.8)
Alcohol dependence	3 (20.7)	3 (22.7)	4 (12.1)	3 (19.9)	4 (23.3)
Non-depend drug abuse	4 (16.6)	4 (17.8)	5 (11.5)	4 (16.8)	5 (15.9)
Neurotic disorder	5 (13.9)	5 (14.0)	3 (13.6)	5 (10.9)	3 (23.8)

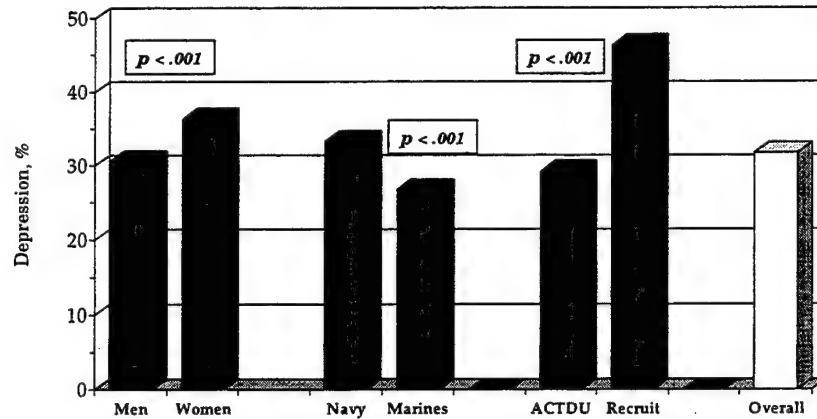
* Percentages sum to more than 100% because patients can receive multiple diagnoses.

This table presents the rank-ordering of the top 5 mental disorders within gender and service subgroups. Percentages indicate the percentage of individuals who received the diagnosis (rather than the percentage of total diagnoses, as in the previous table). If the diagnosis occurred anywhere on a person's record (not just as the primary diagnosis), the individual was counted as having received that particular diagnosis. This analysis profiles suicidal individuals, not admission events, so repeat attempts by the same person were excluded from the calculations.

The rank-ordering is very similar across subgroups, with Personality Disorder ranked first and Adjustment Reaction ranked second in all groups. Personality Disorder was consistently the most prevalent mental diagnosis, with more than half (53%) the sample being so diagnosed. Relative to Marines, a significantly larger percentage of Sailors were diagnosed with Personality Disorder (56% Navy vs. 43% Marines, $p < .001$). Women were more likely than men to receive a diagnosis of Adjustment Reaction (48% vs. 36%, respectively, $p < .001$).

Neurotic Disorder, which ranked fifth overall, was the third-ranked diagnosis among both women and Marines. This category comprises a variety of dysfunctions, but depression and unspecified psychoneurosis were the predominant ones seen in this sample. Marine Corps attempters had the highest proportion of neurotic disorders (24%), more than double that of Navy patients (11%, $p < .001$). A somewhat higher percentage of Marines were also diagnosed as Alcohol Dependent (23%, vs. 20% Navy, $p < .02$), though Marines and Sailors were equally likely to be drug abusers. As would be expected from a variety of behavioral studies, women in the sample had much lower rates of alcohol dependence and nondependent drug abuse than did men ($p < .001$ on both).

Depression by Subgroup* (Parasuicides)



* Includes anyone with at least one ICD-9 code indicating mental depression.

Symptoms of depression have been consistently associated with suicide, suicide attempts, and self-injury. The risk of developing a depressive disorder increases dramatically between the ages of 9 and 19 — the age at which the greatest number of parasuicides occurred in the Navy and Marine Corps.

The general ICD-9 category for neurotic Depressive Disorders was not among the 5 leading mental disorders observed in the sample; in fact, it accounted for only 1% of all mental disorders recorded. Nor was the large group of Affective Psychoses, which includes numerous major depression diagnoses, strongly represented (accounting for about 2%). However, various depressive disorders are embedded as subclassifications within several of the other main ICD-9 categories. For example, the leading mental disorder diagnosis, Personality Disorder, includes a group of affective personality disorders involving depressive symptomatology. And the second-ranking mental diagnosis, Adjustment Reaction, includes both brief and prolonged depressive reactions. Therefore, depression was recomputed to include these various codes (all diagnoses were included in the computation, not just primary diagnosis). When this more inclusive measure was analyzed, the percentage of admissions having at least one diagnosis of depression rose to almost 32%. And yet, by comparison, a recent clinical study of 209 suicide attempters and patients with suicidal ideation (mean age = 22 years) reported that 88% of subjects were suffering from a depressive disorder. Thus, the present findings are unexpectedly low.

As demonstrated in the graph (above), women were significantly more likely than men to receive a diagnosis of depression, Navy attempters were more likely to be depressed than Marines, and recruits had the highest depression rate of all, with almost 47% of recruit parasuicides suffering from some form of depression.

Substance Abuse Among Parasuicides

	<u>Percent of Admissions</u>
● Alcohol	33.3
» <i>alcohol abuse</i>	12.3
» <i>alcohol dependence</i>	21.0
● Drugs (other than alcohol)	6.0
» <i>drug abuse</i>	4.0
» <i>drug dependence</i>	2.0
● Overall substance abuse (<i>drugs and/or alcohol</i>)	35.7
● Substance abuse increase	
» 1989	30.4
» 1995	40.9

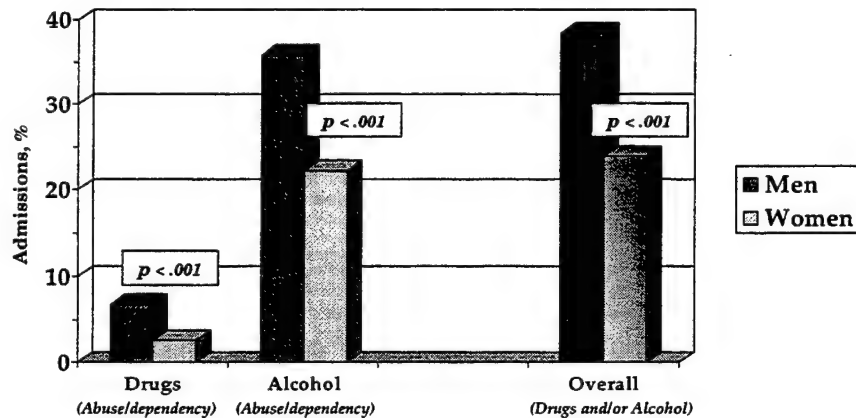
In addition to depression, substance abuse is one of the most important identified risk factors for suicidal behavior. Substance abuse has been associated with a more than 7-fold increase in risk of attempted suicide among veterans, and other research indicates that alcohol abuse ranks second only to affective illness in its strength of association with suicidal behavior.

Drug abuse, drug dependence, and alcohol dependence are recognized as distinct substance use disorders in the ICD-9 classification system. Alcohol abuse is classified as a type of nondependent drug abuse, but it was treated as a separate category in the present analysis. Very few attempters were diagnosed as either drug dependent (2%) or drug abusers (4%, not including alcohol abuse). More were diagnosed as alcohol abusers (12%), and a substantial proportion were alcohol dependent (21%). Overall, 36% of parasuicide admissions were diagnosed with a substance use disorder. Rates of substance abuse among parasuicides increased over the study time period, rising from 30% in 1989 to 41% in 1995.

These figures represent formal diagnoses only. The relatively low percentage of diagnosed alcohol abusers, in particular, should be interpreted cautiously. One would expect excessive drinking to be more common than alcohol dependence, especially in a group of young military personnel, though suicidal individuals might differ on this dimension. Numerous studies have shown that suicide attempters and completers frequently have detectable blood alcohol levels (BAL) at the time of their attempt or death, but unfortunately, BAL was not available in this study.

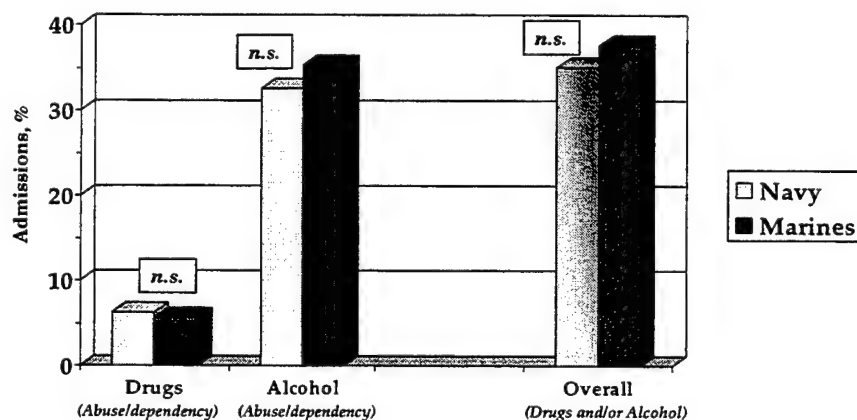
Substance abuse with comorbid depression is a particularly high-risk profile for suicidal behavior. Approximately 9% of parasuicide admissions were diagnosed with both a substance use disorder and some form of depressive disorder.

Substance Abuse by Sex (Parasuicides)



Drug abuse and dependency have been combined in this graph, as have alcohol abuse and dependency. Research in a variety of settings and subject pools continues to confirm that men are more likely to use and abuse drugs and alcohol than are women. In this parasuicide sample, 38% of the men had substance use disorders, compared with 24% of the women. Approximately 4% of attempters were diagnosed with both a drug and an alcohol disorder. Alcohol abuse/dependence was much greater than drug abuse/dependence in both sexes.

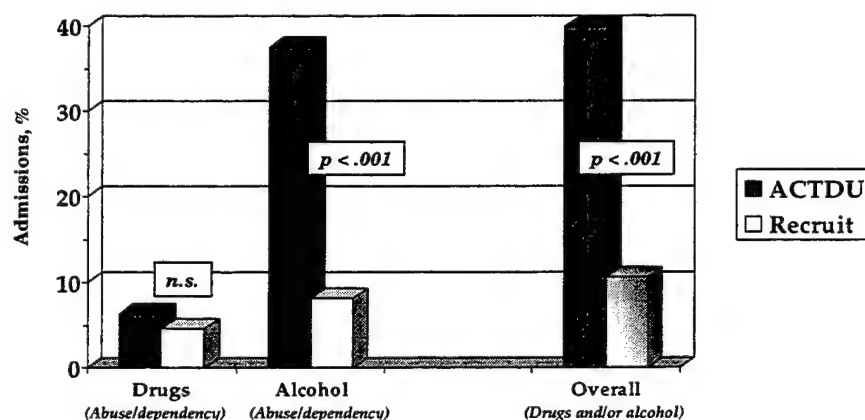
Substance Abuse by Service (Parasuicides)



As shown in the chart (above), there were no significant overall differences in substance abuse disorders between Navy and Marine Corps attempters. Prevalence of drug abuse alone was about 4% in each service, and drug dependence occurred in about 2% of each (total drug diagnoses = 6%). Alcohol dependence alone was somewhat higher among Marine Corps patients (24%, vs. 20% Navy), but alcohol abuse was not (about 12% in each service). Alcohol dependence diagnoses were about twice as prevalent as alcohol abuse diagnoses.

The 1998 *Department of Defense Survey of Health Related Behaviors Among Military Personnel* (DoD Worldwide Survey), which uses anonymous self-report data, reported higher rates of substance abuse in the Marine Corps at large than in the Navy at large. In 1992, which was the midpoint in the parasuicide study, 30% of Marines versus 17% of Navy personnel reported heavy alcohol use on the Worldwide Survey. By comparison, total diagnosed alcohol disorders (abuse or dependence) in the parasuicide sample were 35% for Marines, 33% for Navy patients. On the Worldwide Survey, 11% of Marines and 7% of Sailors acknowledged using illicit drugs, while in the parasuicide sample, about 6% in each service were diagnosed with drug abuse or dependence.

Substance Abuse by Recruit Status (Parasuicides)



Substance abuse rates among recruits were the lowest of any group. About 5% of recruits were diagnosed with a drug disorder, 8% with an alcohol disorder, and less than 11% with an overall substance problem, compared with 40% among other active duty attempters. This might seem surprising, since alcohol and drug abuse are widespread among U.S. adolescents and young adults in general, and substance abuse has been strongly associated with suicidal behavior in this age group. However, recruits' lives are very restricted, and their access to alcohol and street drugs is quite limited. Although recruits were as likely as other patients to have used a drug overdose in the parasuicide incident, the types of drugs that they used for self-poisoning were often obtainable over-the-counter (eg, aspirin, antihistamine, cough syrup) or by prescription (eg, antibiotics), rather than the kinds of drugs most frequently abused by their civilian peers (eg, marijuana, cocaine, methamphetamine). Another factor, of course, is the military's random drug testing, which is a strong deterrent to illegal drug use.

Length of Hospital Stay (LOS) (Parasuicides, by Subgroups)

Demographic Groups			Diagnostic Groups		
Group	× LOS* (# days)	P<	Group	× LOS* (# days)	P<
Men	7.1	<i>n.s.</i>	Mental disorder [†]	8.4	<i>.001</i>
Women	6.3		Other primary diagnosis	5.6	
Navy	7.3	<i>.001</i>	Substance abuse [‡]	8.4	<i>.001</i>
Marines	5.9		No substance abuse	6.2	
Fleet ACTDU	7.0	<i>n.s.</i>	Repeat attempts	8.9	<i>n.s.</i>
Recruit	6.8		No repeats	6.9	

* LOS = Length of stay

[†] Primary diagnosis = ICD-9 codes 290 – 319 (includes substance abuse).

[‡] Any diagnoses of substance abuse (not just primary diagnosis).

Average LOS for parasuicides was 7 days. Navy attempters were hospitalized about a day and a half longer than Marines, but men and women did not differ significantly on LOS, nor did recruits and other active duty personnel. Navy attempters were more likely to have a psychological disorder as their primary diagnosis, which might help explain their higher LOS.

Turning attention to the diagnostic subgroups, we find support for this explanation. Patients diagnosed with a mental disorder (as primary diagnosis) had significantly longer hospitalizations than those with other primary diagnoses. Separate analyses showed that this remained true even when substance abuse was excluded from the mental disorder group. Substance abusers themselves had significantly longer stays than nonabusers, due partly to the inclusion of inpatient substance rehabilitation programs (if prescribed) in an individual's total LOS. Regardless of the reason, it is obvious that more hospital resources are needed to treat parasuicides with primary psychological or substance use disorders.

The average LOS for repeat attempters was two days longer than for nonrepeaters. However, the number of repeat attempts ($N = 118$) was very small relative to the nonrepeaters ($N = 4578$), and the observed difference was not statistically significant.

Characteristics of First-Admission Trauma Patients Parasuicides vs. Nonattempters

Demographic Variables				Hospitalization Variables			
Variable	Parasuicides (N=4532)	Nonattempters (N=43,022)	P<	Variable	Parasuicides (N=4532)	Nonattempters (N=43,022)	P<
Age, mean	22.5	25.6	.001	ER admission, %	46.7	21.3	.001
Women, %	18.5	6.0	.001	Number of diagnoses, mean	3.5	2.1	.001
Marines, %	24.0	30.1	.001	LOS, mean days	6.9	5.3	.001
Nonwhite, %	22.0	22.9	n.s.	Substance abuse, %	35.4	6.4	.001
Paygrade, mean	2.8	4.5	.001	Psychological disorder, %	94.2	11.4	.001
Recruits, %	14.6	3.6	.001	Depression, %	32.6	1.0	.001
<12 y educ, %	8.4	5.0	.001				

Parasuicides (with deliberate, self-inflicted APV injuries) were compared with all other first-admission trauma patients (with accidental or other-inflicted APV injuries) on demographic and diagnostic characteristics. Significant differences were observed between the two groups on every variable except race. Attempters were younger than nonattempters, with a higher percentage of women and a lower proportion of Marine Corps personnel. They were lower in paygrade, with a much higher percentage of recruits and more non-high school graduates. More parasuicides were admitted through the hospital emergency room; they had more diagnoses at admission and were hospitalized longer than other trauma patients. Parasuicides evidenced more psychological disorders in general, and more substance abuse and depressive disorders in particular. Their demographic profile relative to nonattempters was very similar to the enlisted Navy parasuicides' profile relative to the enlisted Navy at large.

Repeat Attempts Among Parasuicides

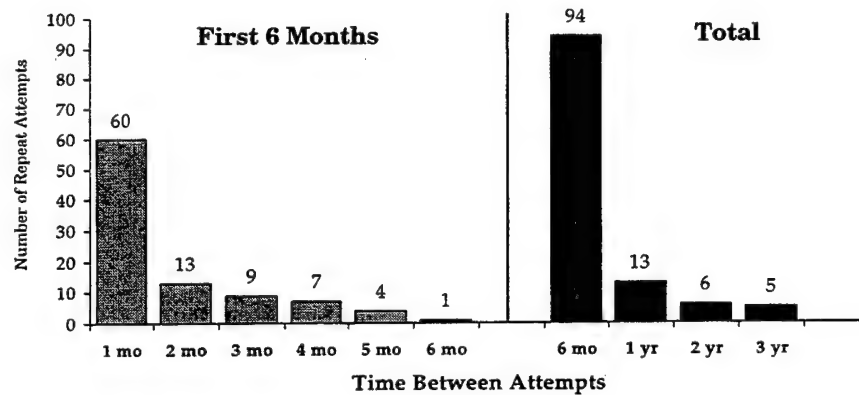
- N = 118 repeat attempts (2.5% of sample)
 - » 115 second attempts
 - » 3 third attempts
- Repeaters had significantly more substance abuse
- No difference on other mental disorders (*excluding substance abuse*)
- Repeat parasuicides did not differ from nonrepeaters on age, sex, race, branch of service, marital status, LOS, or disposition
 - » Recruits were less likely to be repeaters than were other ACTDU attempters

Earlier studies of suicidal behavior found that between 15% and 26% of parasuicides repeated deliberate self-injury within 1 year, and it has been estimated that about 10% of those who attempt suicide succeed within 10 years. In this sample of Navy and Marine Corps parasuicides, the attempt was repeated by only 2.5% of the sample. There are several possible explanations for this low figure. The most optimistic one is that treatment intervention successfully addressed the underlying psychological problems or transitory situational stresses precipitating the self-injurious behaviors, and they were not repeated in most cases. Another possibility is that some unknown number of repeat attempts were treated privately in civilian health care facilities to avoid any (or further) detrimental effect on the individual's military career. A third explanation is that many first-time attempters were discharged from the military shortly after returning to their commands and were no longer tracked in the military hospitalization record; further research could explore this last possibility.

One early study found that, while women have much higher attempt rates than men, men were slightly more likely to repeat an attempt. However, there was no difference in the present sample between men and women in repeat attempts. In fact, there were no differences in repeat rates for any demographic group except recruits, who were less likely to be repeaters than were other active-duty parasuicides. Nor were there differences between repeaters and nonrepeaters on LOS, percentage with mental disorder diagnoses, or treatment disposition. However, 47% of repeaters were diagnosed with substance use disorders, compared with 35% of nonrepeaters.

Of the 3 individuals who made 3 attempts each during the time period studied, all were male Marines; 2 were nonwhite; none were recruits. One was diagnosed with personality disorder, one with substance abuse, and one with both. Two were returned to duty after all 3 attempts; one went AWOL after both the second and third attempts.

Time Between Repeat Attempts



The majority of repeat attempts ($N = 60$, or 51%) occurred within the first month following hospitalization for the first attempt; 80% had occurred within 6 months, and 91% within a year. (Mean length of time between attempts was 4 months.)

In one type of personality disorder, suicidal behavior helps to define the diagnosis. Such individuals often use suicidal threats and gestures to express their feelings and manage personal crises. Although the number of repeat parasuicides in this study was relatively small, further analysis of this subsample could yield valuable insights into the relationships between mental disorder and parasuicide.

Summary

- First study of parasuicides in Navy and Marine Corps
- Overall prevalence rates basically unchanged from 1989 to 1995
 - » Rates higher for Navy and for Women
 - » Among women: Marines higher
- Psychological disorder in 95% of cases
 - » Mental disorders increased 1989 to 1995
 - » Leading diagnosis = Personality Disorder
 - » Substance abuse in 36% of cases
- Parasuicides (vs. Other trauma patients):
More ER admissions, more diagnoses, longer LOS
- Aggregate profile of a parasuicide:
 - » Young (18-21years); female; Navy; E1-E2/recruit; less education; self-inflicted drug overdose; diagnosed with mental disorder; hospitalized 1 week; returned to duty

Young men and women, many with difficult economic or family histories, are particularly vulnerable to emotional distress when they first transition to the rigors of military life. By the same token, older individuals are not immune to the stresses of family separation, job rotation, extreme work environments, threat of combat, and other conditions endemic to work in the military services. These stressors, especially if compounded by the exigencies of personal relationship difficulties or alcohol/drug abuse, can prove temporarily overwhelming to vulnerable individuals, and suicidal behavior can ensue. The naval services have initiated suicide prevention programs to address this problem, but research is needed to help structure and develop effective prevention efforts.

This is the first population-based study to examine the nature and prevalence of parasuicides in the Navy and Marine Corps. During the period between 1989 and 1995, parasuicide rates fluctuated, but the overall "trend" was a static one: rates were about the same in 1995 as they were in 1989. Moreover, it appears that suicide completion rates (based on the ratio of deaths to attempts) may be higher in the military than in the civilian sector. Risk factors associated with parasuicide were age (young), sex (female), paygrade (E1-E2/recruit), education (less than 12 years), and branch of service (Navy), though Marine Corps women had the highest parasuicide rates.

Psychological disorders were diagnosed in 95% of parasuicide admissions, more than half the sample being diagnosed with Personality Disorder. "Pure" mental disorder primary diagnoses (excluding substance abuse) tripled between 1989 and 1995, while substance use disorders increased to 41% in 1995. One Harvard physician has stated that the only proven way to prevent suicide is to treat depression and other emotional disorders. These findings suggest that prevention efforts might be enhanced by focusing on mental health issues, particularly among recruits and young enlistees.

Further Research

- Demographically adjusted prevalence rates
- Prediction models for parasuicide risk factors
- In-depth exploration of mental disorders
- Career progression/outcomes
- Comparisons of parasuicides, suicide completers, and suicide contemplators

The foregoing analyses have presented initial, descriptive findings regarding naval parasuicides. They provide the foundation for further investigation and should be considered preliminary. The research database, though limited primarily by the lack of subjective patient data, nevertheless affords a rich resource for further work. However, it is essential that more recent data be captured and integrated before drawing any conclusions regarding current trends in parasuicide rates or their accompanying morbidities.

In future work, the sample should be stratified by age within the gender and service groupings to permit adjusted statistical comparisons with other populations (eg, suicide completers, civilian attempters, hospitalized nonattempters, other psychiatric groups). Risk factors identified in univariate and bivariate analyses should be tested in multivariate analyses to develop prediction models of parasuicidal behavior. Several important psychiatric risk factors were observed in these preliminary analyses, and more in-depth examination of these factors is needed. Issues such as the comorbidity of substance abuse and other disorders, the types of diagnoses associated with lengthy hospitalization, and the differential appearance of particular diagnoses among subgroups would help refine our understanding of the relationship between parasuicide and psychological disorder.

Another objective for further research is to link hospitalization records with longitudinal career data to examine career outcomes for these patients, such as medical boards, promotions and demotions, UA/AWOL/desertion incidents, and separation from service.

A final objective is to compare the demographic and diagnostic profiles of parasuicides with those of suicide completers and contemplators.

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13. ABSTRACT (Maximum 200 words) This is the first population-based study to identify and analyze nonfatal suicide attempts (parasuicides) in the US Navy and Marine Corps. Study objectives were to (1) determine parasuicide prevalence rates; (2) develop sociodemographic profiles of attempters by gender, service, and recruit status subgroups; (3) develop diagnostic profiles of attempters by the same subgroups; and (4) characterize diagnostically relevant groups, including substance abusers, repeat attempters, and those with mental disorders. All active-duty Navy and Marine Corps hospital admissions between 1989 and 1995 (N = 410,384 archival records) were examined, and 4696 records (1.1%) were identified as probable parasuicides. <i>International Classification of Diseases, 9th Revision</i> diagnostic codes and Bureau of Medicine and Surgery injury cause codes were used to define the case sample. Overall, prevalence of parasuicides remained unchanged from 1989 to 1995. Risk factors associated with parasuicide were age (young), sex (female), paygrade (E1-E2/recruit), education (less than 12 years), and branch of service (Navy), though Marine Corps women had the highest parasuicide rates. Approximately 64% of cases used self-poisoning in their suicide attempt; about 31% used cutting; less than 1% used firearms. Mental disorders (including substance abuse disorders) were diagnosed in 93% of parasuicide admissions; more than half received a diagnosis of personality disorder. Mental disorder primary diagnoses more than doubled between 1989 and 1995, while substance use disorders alone increased from 30% to 41%. Focusing on mental health issues, particularly among recruits and young enlistees, might enhance prevention efforts.				
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